Addleton Academic Publishers

American Journal of Medical Research 7(2), 2020
pp. 15–21, ISSN 2334-4814, eISSN 2376-4481

The Mood Log – A Tool for Clustered Maintenance TMS

Saxby Pridmore
S.Pridmore@utas.edu.au
School of Medicine, University of Tasmania,
Hobart, Tasmania, Australia;
TMS Department, Saint Helen's Hospital,
Hobart, Tasmania, Australia
(corresponding author)
Sheila Erger
Sheila.Erger@healthscope.com.au
TMS Department, Saint Helen's Hospital,
Hobart, Tasmania, Australia
Marzena Rybak
mrybak@netspace.net.au
TMS Department, Saint Helen's Hospital,
Hobart, Tasmania, Australia
William Pridmore
wpridmore@gmail.com
Launceston General Hospital,
Launceston, Tasmania, Australia

ABSTRACT. Transcranial magnetic stimulation (TMS) is a safe and effective treatment of treatment resistant major depressive disorder (MDD). However, MDD is a chronic disorder and relapse is common. The leading method of managing those cases of MDD who respond to TMS, but continue to relapse, is to provide maintenance TMS – short courses of 5 treatments over 2.5 days, repeat at monthly (or greater) intervals. The strategy is to increase the interval between treatment clusters and for patients to be discharged when they have been able to remain well for a couple of months. However, patients and doctors are both frequently apprehensive about increasing the between cluster interval, and patients tend to remain in treatment programs for long periods. We present a protocol and instrument to assist in moving from treatment to discharge, which we have found helpful.

Keywords: major depressive disorder; transcranial magnetic stimulation; neuromodulation; relapse prevention

How to cite: Pridmore, S., Erger, S., Rybak, M., and Pridmore, W. (2020). "The Mood Log – A Tool for Clustered Maintenance TMS," *American Journal of Medical Research* 7(2): 15–21. doi:10.22381/AJMR7220202

Received 16 April 2020 • Received in revised form 28 June 2020
Accepted 30 June 2020 • Available online 3 July 2020

Risk of Relapse in Major Depressive Disorder (MDD)

Patients suffering major depressive disorder (MMD) come to transcranial magnetic stimulation (TMS) after they have failed to respond to other treatments (psychotherapy, pharmacotherapy). Patients who have failed to respond to any form of treatment of depression are at high risk of relapse (Rush et al., 2006). Relapse following the cessation of antidepressant medication is common (Berwain et al., 2017). Resistance to antidepressant medication predicts a less favorable clinical response to TMS and ECT (Purdic et al., 1996).

Also, relapse following successful ECT is a major challenge (Kellner, 2013). A meta-analysis of ECT outcome reports that following successful treatment, 27.1% of patients have relapsed at 3 months, 34% at 6 months, and 51.1% at 12 months (Jelovac et al., 2013). Following successful treatment, TMS has a very similar relapse rate – with 33.5%, relapsing after 3 months, 47.1% after 6 months, and 57% relapsing at 12 months (Senova et al., 2019).

That relapse occurs after the cessation of a successful course of TMS does not indicate that TMS is an ineffective treatment (as we have seen above, a similar relapse rate follows the cessation of successful ECT) – such relapses simply indicate that the disease process is virulent. Thus, on-going strenuous treatment is justified.

Following successful courses of ECT, remission maintenance programs provide further ECT treatments, on a less frequent basis. A common protocol (following a successful acute course) is for a single treatment to be provided on a weekly basis, then two weekly, and eventually one ECT treatment may be provided at monthly intervals (Fink et al., 1996).

Cluster Maintenance TMS

A comparable treatment process has been described when relapse has occurred soon after a successful acute course of TMS. This is termed “clustered maintenance TMS” (Fitzgerald et al., 2013). Following a second successful acute course of TMS, at intervals of at least 4 weeks, patients receive clusters of 5 TMS treatments over 2.5 days.

Fitzgerald et al. (2013) reported an open study of 35 patients who had completed a successful acute course, but soon relapsed. One month following a second successful acute course, clustered maintenance TMS was instituted. Comparing the time to relapse following the first and the second acute courses, clustered maintenance TMS substantially delayed relapse. More recently, in a large randomized controlled trial, clustered maintenance TMS was significantly more effective in preventing relapse than antidepressant medication (Wang et al., 2017). Our group found cluster maintenance TMS at monthly and greater intervals restores remission when patients are drifting into relapse (Pridmore et al., 2018).

Time between Clusters of Treatment

The time between clusters starts at one month (Fitzgerald et al., 2013; Wang et al., 2017) and generally increases. Our group reported 14 patients who had been maintained well for more than 12 months (Pridmore and May, 2018) – the time between clusters commenced at one month and was lengthened, over the year, to a mean 5.4(0.8) weeks. We believe that if we had used the protocol described herein, that interval would have been much greater.

The maintenance of remission is desirable – it means less episodes of pain/suffering for patients, and longer symptom free periods are associated with lower risk of further relapse/recurrence (Furukawa et al., 2008).

Increasing the time between clusters reduces cost and patient inconvenience. However, while somewhat inconvenient, many patients find attendance for clustered TMS to be pleasant – they meet familiar, skilled staff, receive cutting-edge treatment, and achieve a lift in mood. Also, recent treatment is reassuring, it is insurance against an imminent relapse. Therefore, some patients are reluctant to increase the time between clusters.

Treating clinicians are also often concerned that increasing the time between clusters beyond (an unknown) critical point may diminish the protective effect of the program and allow relapse. An administrative concern is that failure to extend the time between clusters for individual patients can mean the provision of unnecessary (wasteful) service to some, and the blocking of service to new patients in need of such care.

To this point, no strategy has been available to assist us in grading the patient's well-being during (and thereby increasing) the interval between clusters of TMS treatments. It is not uncommon for centers providing this treatment to have a group of patients who have been receiving clustered TMS at monthly intervals for long periods without the need for such intense treatment having been tested.

The Mood Log

To efficiently plan clustered maintenance TMS, we needed to gain insight into the mental state of patients during the weeks between clusters of treatment. We developed a "Mood Log" – a subjective mood rating scale which is completed on a weekly basis and brought along to the clinic when the patient returns for the next cluster of treatment. The Mood Log is a stack of horizontal strips of 10 boxes running from the anchor point "no depression" on the left of a page across to "most depression" on the right. The staff attach dates to the strips to remind patients when they should be scored. Some patients set an alarm on their telephone to remind them to complete this task.

The interval between the acute course and the first cluster of maintenance TMS is four weeks. Thus, when patients complete an acute course, they are

given a page with at least 4 rating strips, to be scored and returned as stated. The interval between the first and second clustered maintenance TMS is determined by the Mood Log scores made between the acute treatment and the first cluster of treatment. And so on, the scores of the previous interval direct the length of the next interval.

On completion of a successful acute course or a maintenance cluster of TMS, the subjective depression rating score is usually around 2. Over subsequent weeks a wide variety of ratings is possible, but two patterns are common. First – little change from week to week with most scores are around 2 (remaining well) (Fig. 1). Second – each week the score grows by 1 or 2, so that at four weeks (for example), the score is about 5 (mood deterioration) (Fig. 2).

Discharge from the Program

If the Mood Log scores remain in the region of 2 and 3, we frequently attempt to increase the inter-cluster interval. If the Mood Log scores increase and are greater than 3, in general, we do not increase the time between clusters, but repeat the recently completed interval. With this protocol of extending the interval when the subjective depression scores show little change and repeating the recent interval when there is evidence of higher subjective depression scores, we work towards a successful 8-week interval and possible discharge.

When patients have remained relatively symptom-free for 8 weeks, they may request discharge on condition that they can receive further treatment, if needed, in the future. An apprehensive patient may not make this request, in which case, the staff may suggest further treatment does not appear necessary at that time. Another 8-week interval followed by a further cluster of treatment, may be appropriate. Unfortunately, with chronic relapsing MDD, a period of equanimity may not persist, despite promising indicators

After more than 5 years of providing clustered maintenance TMS we had discharged more than 30 patients (65% female) and were still providing (beyond 6 months) clustered maintenance to 35 (70% female) patients. The Mood Log assisted those patients and the treating clinicians in better managing the situation. We were able to lengthen the between cluster interval for many and to discharge 10 (28%).

At the moment there is evidence that some patients will need to remain in treatment for an extended period of time – here, the aim is to reduce the amount of treatment to a safe minimum (by safely extending the interval between clusters of treatment).

Conclusion

MDD is frequently a relapsing condition. TMS is frequently effective in acute treatment. Clustered maintenance TMS is helpful in providing frequently relapsing patients with longer periods of remission. However, patients may remain in maintenance programs for unnecessarily long periods. Both patients and clinicians are reluctant to discontinue maintenance treatment. Having quantitative information about the patient's subjective experience over the weeks between treatment clusters can help greatly in clinical judgement and planning. The Mood Log is a tool which provides a structured, regular (weekly) subjective mood score, which is a useful indicator of the near future, and a quantitative data set which can be used in discussion and planning.

Author contributions
All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

Conflict of interest statement
The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

REFERENCES

Berwain, I, Walter, H., Selfritz. E., and Huys, Q. (2017). "Predicting Relapse after Antidepressant Withdrawal – A Systematic Review," *Psychological Medicine* 47(3): 426–437. doi: 10.1017/S0033291716002580.

Fink, M., Abrams, R., and Bailine, S. (1996). "Ambulatory Electroconvulsive Therapy: Report of a Task Force of the Association for Convulsive Therapy," *Convulsive Therapy* 12(1): 42–55.

Fitzgerald, P., Grace, N., Hoy, K., Bailey, M., and Daskalakis, Z. (2013). "An Open Label Trial of Clustered Maintenance rTMS for Patients with Refractory Depression," *Brain Stimulation* 6(3): 292–297. doi: 10.1016/j.brs.2012.05.003.

Furukawa, T., Fujita, A., Harai, H., Yoshimura, R., Kitamura, T., and Takahsehi, K. (2008). "Definitions of Recovery and Outcomes of Major Depression: Results from a 10-Year Follow-up," *Acta Psychiatric Scandinavia* 117(1): 35–40. doi: 10.1111/j.1600-0447.2007.01119.x.

Jelovac, A., Lolshua, E., and McLoughlin, D. (2013). "Relapse Following Successful Electroconvulsive Therapy for Major Depression: A Meta-Analysis," *Neuropsychopharmacology* 38: 2467–2474. doi: 10.1038/npp.2013.149.

Kellner, C. (2013). "Relapse after Electroconvulsive Therapy," *The Journal of ECT* 29(1): 1–2. doi: 10.1097/YCT.0b013e31826fef01.

Pridmore, S., and May, T. (2018). "Relapse Prevention (RP) TMS," *Brain Stimulation* 11(6): 1391–1392. doi: 10.1016/j.brs.2018.08.004.

Pridmore, S., Erger, S., Rybak, M., Kelly, E., and May, T. (2018). "Early Relapse (ER) Transcranial Magnetic Stimulation (TMS) in Treatment Resistant Major Depression," *Brain Stimulation* 11(5): 1098–1102. doi: 10.1016/j.brs.2018.05.013.

Prudic, J., Haskett, R., Mulsant, B., Malone, K., Pettinati, H., Stephens, S., et al. (1996). "Resistance to Antidepressant Medication and Short Term Clinical Response to Electroconvulsive Therapy," *American Journal of Psychiatry* 153(8): 985–992. doi: 10.1176/ajp.153.8.985.

Rush, A., Trivedi, M., Wisniewski, S., Nierenberg, A., Stewart, J., Warden, D., et al. (2006). "Acute and Longer-term Outcomes in Depressed Outpatients Requiring One or Several Treatment Steps: A STA*D Report," *American Journal of Psychiatry* 163(11): 1905–1917.

Senova, S., Cotovio, C., Pascual-Leone, A., and Olivera-Maia, A. (2019). "Durability of Antidepressant Response to Repetitive Transcranial Magnetic Stimulation: Systematic Review and Meta-Analysis," *Brain Stimulation* 12(1): 119–128. doi: 10.1016/j.brs.2018.10.001.

Wang, H.-N., Wang, X.-X., Zhang, R.-G., Wang, Y., Cai, M., Shang. Y.-H., et al. (2017). "Clustered Repetitive Transcranial Magnetic Stimulation for the Prevention of Depressive Relapse/Recurrence: A Randomized Controlled Trial," *Translational Psychiatry* 7: 1292. doi: 10.1038/s41398-017-0001-x.

Table 1 Mood Log results over a 7 week period. There had been little change in the subjective depression scores, reaching a maximum of 2. The between cluster interval, for this patient, was increased by one week (to 8 weeks).

Mood Log

At discharge (17 / \ /2020)
No depression — Most depression

Week 1 (24/ \ /2020)
No depression — Most depression

Week 2 (31 / 2 /2020)
No depression — Most depression

Week 3 (7 / 1 /2020)
No depression — Most depression

Week 4 (14/ 2/2020)
No depression — Most depression

Week 5 (21/ 2/2020)
No depression — Most depression

Week 6 (28/ 2/2020)
No depression — Most depression

Week 7 (6 /3/2020)
No depression — Most depression

Week 8 (/ /2020)
No depression — Most depression

Table 2 Mood Log results over a 7 week period. There had been progressive increase in the subjective depression scores, reaching a maximum of 7. After the cluster of TMS the score fell again to 3. For this patient, the interval between clusters was not altered – the next cluster being scheduled after a further 7 weeks.

Mood Log